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Fleet / Facilities / Special Projects



Average Biodiesel Emission Reductions Compared to #2 Diesel

Emission Type	B100	B20
Unburned Hydrocarbons	-67%	-20%
Carbon Monoxide	-48%	-12%
Particulate Matter	-47%	-12%
NOx	+10%	+2%

Emission Reductions

Ethanol with O2Diesel

PM
Reduced

20 – 46%

NOx
Reduced

1.8 – 8.5%

CO
Reduced

12 – 23%

Smoke
Reduced

Up to 70%

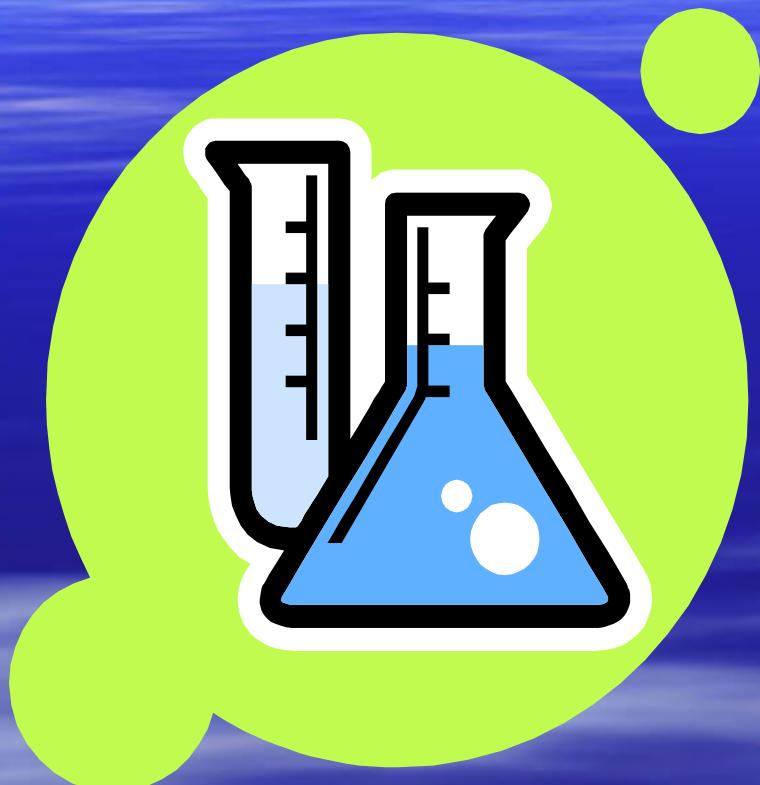
Data from over 180 engine tests and field smoke tests

Engine Data – Colorado School of Mines, SWRI & Ricardo

Our Question?

Can two clean renewable fuels such as Ethanol and Biodiesel be blended together?

Our Fuel Blend



- 71.6% - ULSD
- 20% - Bio
- 7.7% - Ethanol
- .7% - O²Diesel



Our Test Engine

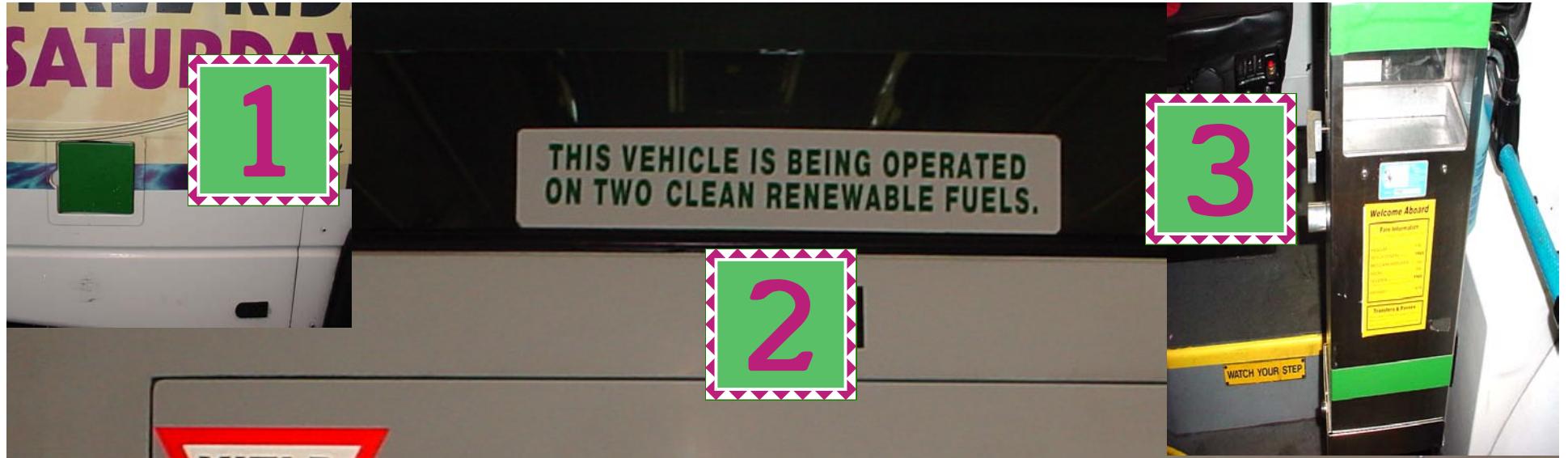
Our Test Fleet

Five Different Chassis Manufacturers

Seven Different Diesel
Engines



THIS VEHICLE IS PART OF AN OPERATIONAL TEST
AND IS BEING OPERATED ON BIODIESEL AND
ETHANOL, TWO RENEWABLE FUELS MADE FROM
AGRICULTURAL PRODUCTS. THIS FUEL
COMBINATION PRODUCES LESS EMISSIONS AND
CAN HAVE A POSITIVE IMPACT ON OUR
ENVIRONMENT AND HUMAN HEALTH.
FUNDING FOR THIS TEST IS BEING PROVIDED BY
THE UNITED STATES GOVERNMENT AND
O'DIESEL, INC.



What We Learned With a 28% Fuel Blend in Our Test Engine

- Exhaust temperatures were 6.5° less
- Fuel temperature was 18° less
- The horsepower loss was less than 4%
- Fuel consumption was the same as ULSD
- Engine oil temperature was 3° less

Composite Fuel Emission Reductions

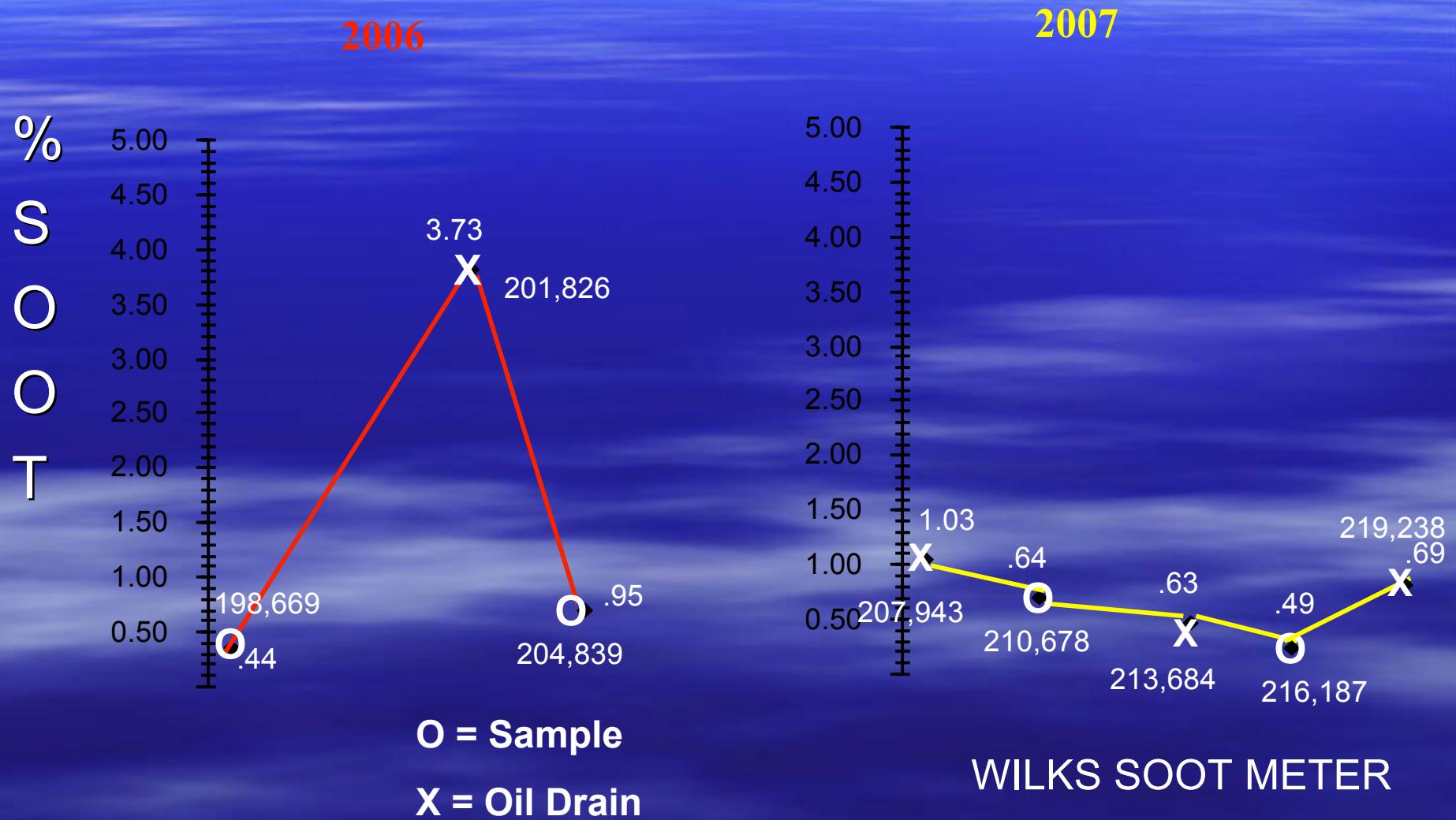
	NOx	PM
Base Fuel ULSD	4.6	0.19
O2Diesel	-0.9	-20
B20 + O2Diesel	1.7	-31.3

1991 Series 60

SWRI – Feb. ‘07

Lubricating Oil Soot Level

Bus 243 1998 Series 40 Detroit



SMOKE TESTING

Vehicle	ULSD	Bio2	Mileage	Engine
#207	17.2	6.7	150,828	6V92TA
#243	15.9	9.4	212,803	Series 40
#245	2.9	1.2	107,068	ISL
#501	13.7	7.2	131,547	ISB
#716	3.9	2.1	186,794	Series 60
#883	10.4	2.7	182,711	7.3 DIT

Bosch RTT100 Opacimeter

FUEL CONSUMPTION

TEST VEHICLE AVERAGE

#2 Diesel	4.84 mpg (47,764 miles)
ULSD	4.75 mpg (50,769 miles)
B2O + O2 Diesel	4.39 mpg (40,923 miles)

Data: Fleet-Net

What Does This Blend Do For Us?

- Reduces Emissions
- Improves lubricity
- Provides for better flow characteristics
- Makes for easier starting
- Compliments a cleaner burning fuel

Our Blend Can Have a Positive Impact On:

- The environment and human health
- Our State's economy
- Agriculture
- United States balance of trade

Economic impact:

Currently, for every \$1 spent buying diesel in Virginia, a large portion goes to crude oil with only \$0.134 staying locally through state tax and local distributor income (Figure 1).

If locally produced Biodiesel was used, for every \$1 spent, potentially 90 cents would stay in the local or state economy (Figure 2).

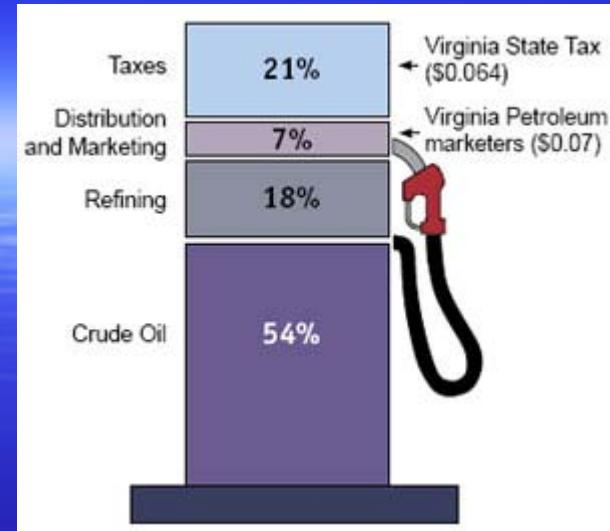


Figure 1. Distribution of \$1 cost of diesel fuel at public pumps

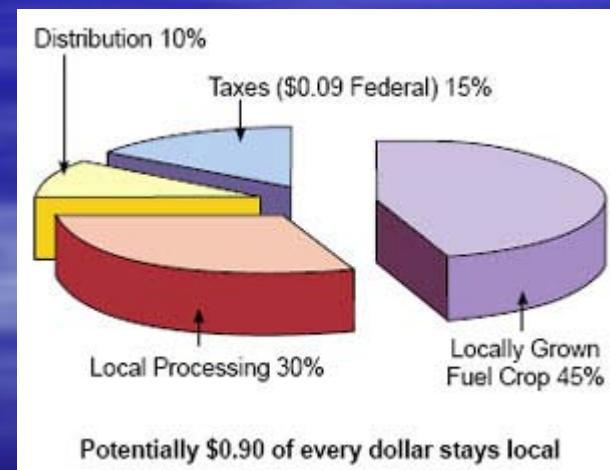


Figure 2. Distribution of \$1 cost of Biodiesel fuel at public pumps

Source:

Virginia Tech
October 2006

Subject to your questions...

